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Storage Project of Wet Distillers Grains

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Introduction

On October 18, 2006, one load of wet distillers grains from Pine Lake Corn Processors LLC, Steamboat Rock, IA was delivered to the ISU McNay Research Farm southwest of Chariton, IA via walking-bed semi-truck. The analysis of that product is given in Table 1.

Materials and Methods

The storage procedure for this product was to mix it with tub-ground, poor quality hay (Table 1) and pack it into a plastic bag utilizing a Kelly Ryan bagger. This tub-ground hay was typical of poor quality hays in Iowa—sufficient in protein to meet a gestating beef cow's needs, but insufficient in energy for beef cow maintenance at 49.68%. Macro minerals in the hay are lower than previous survey work, however, this is logical due to this hay being stored outside for more than one year.

Starting at 12:45 p.m. on October 18, 2006, the staff at the McNay Farm in addition to Animal Science staff started the process of loading, mixing, and hauling the mixed product to the bagger for the storage procedure. Two different mixing wagons, Oswalt and Artsway, were used in the process. The objective of this storage procedure was to mix 80% wet distillers grains (DG) and 20% hay on an as-fed basis. Because wet DG is a sticky product and tends to create globs, it is difficult to exactly incorporate this product with hay when using a loader tractor. However, as Table 2 shows, the incorporation rate with hay was reasonably accurate. The range of incorporation into the mixer wagons was from 77.3% to 86.0% with an average of 80.5%.

A total of 37 mixed wagonloads were delivered to the bagger and put into the plastic bag. During the process, a time log was written with the first load going into the bagger at 12:57 p.m. and the last at 5:29 p.m. for a total amount of time of 4 hours and 32 minutes or 7.35 minutes/load. The efficiency of this operation would likely improve if larger mixer wagons were available. While bagging was taking place, the feeding throat area of the bagger plugged three times which caused short delays in the unloading stage of the operation.

Results and Discussion

A total of 57.51 tons of mixed product were stored in the 8-ft bag (Table 2). On an as-moisture basis, the product mix ended up being 80.5% wet DG and 19.5% dry tub-ground hay. On a dry-matter basis the mixed product was 61.2% wet DG and 38.8% tub-ground hay. The analysis going into the bag via grab samples was 52.78% dry matter and 20.51% crude protein. After opening the bag, another sample was analyzed and it was 38.95% dry matter and 24.48% crude protein.

Lactating, mature fall-calving Angus cows in two groups were fed the mixed product for 39 days starting November 27, 2006. It was utilized as a high-protein, high-energy supplement and fed to the cows on Monday, Wednesday, and Friday. At feeding time, the mixed product was mixed with some additional hay to stretch the total product and then fed on the ground under an electric fence wire. The additional hay was 16.1% crude protein and 53.4% total digestable nutrients (TDN) on a dry matter basis. During the other days, cows were offered lower quality large round bales of hay in big round bale feeders. At each feeding, the average amount offered per cow was 36.2 lb of the wet DG/hay mix and 8.6 lb of the added hay. Palatability of the mixture was excellent and there was little

refusal or waste at feeding time. Weather was very mild during the feeding period and no feeding challenges were noted.

number of fall calving, mature lactating Angus females.

This method of storing wet DG proved to be very effective with 7.4% storage and feeding loss. An 80/20 blend proved to work well in the storage bag and was eagerly and readily consumed with little or no waste by a large

Acknowledgments

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Table 1. Analysis of wet distillers grains and ground hay used at ISU McNay Farm prior to and post bagging (100% dry matter basis).

<u>Item</u>	<u>Wet distillers grain</u>	<u>Ground hay</u>	<u>Mixed product after bagging</u>
Dry matter	30.48%	79.79%	38.95%
Moisture	69.52%	20.21%	61.05%
Crude protein	27.97%	12.72%	24.48%
ADF	20.49%	50.35%	27.17%
NDF	32.20%	74.24%	na
Fat	11.11%	-----	
Ash	4.43%	-----	
Calcium	.10%	.43%	.33%
Phosphorus	.79%	.28%	.63%
Magnesium	.28%	.16%	.27%
Potassium	.97%	2.61%	1.40%
Sulfur	.75%	.18%	na
TDN (OARDC)	86.2%	49.68%	na
NEm (OARDC)	96.57 Mcal/cwt	43.47 Mcal/cwt	na
NEg (OARDC)	66.06 Mcal/cwt	18.68 Mcal/cwt	na
NEl (OARDC)	90.51 Mcal/cwt	na	na
NEl (ADF)	74.16 Mcal/cwt	49.94 Mcal/cwt	na

na=not available

Table 2. Summary of mixing wet distillers grains with tub-ground hay.

<u>Mixed product into bag</u>				
	<u>As is basis</u>	<u>% of total</u>	<u>Dry matter basis</u>	
Wet DG, lb	92,561	80.5	28,213	61.2%
Ground hay, lb	22,463	19.5	17,923	38.8%
Total, lb	115,024	100.0	46,136	100.0%

Mixed product fed to cows
39 days fed 106,540 lb

Unaccounted feed loss 8484
% storage and feeding loss 7.4%